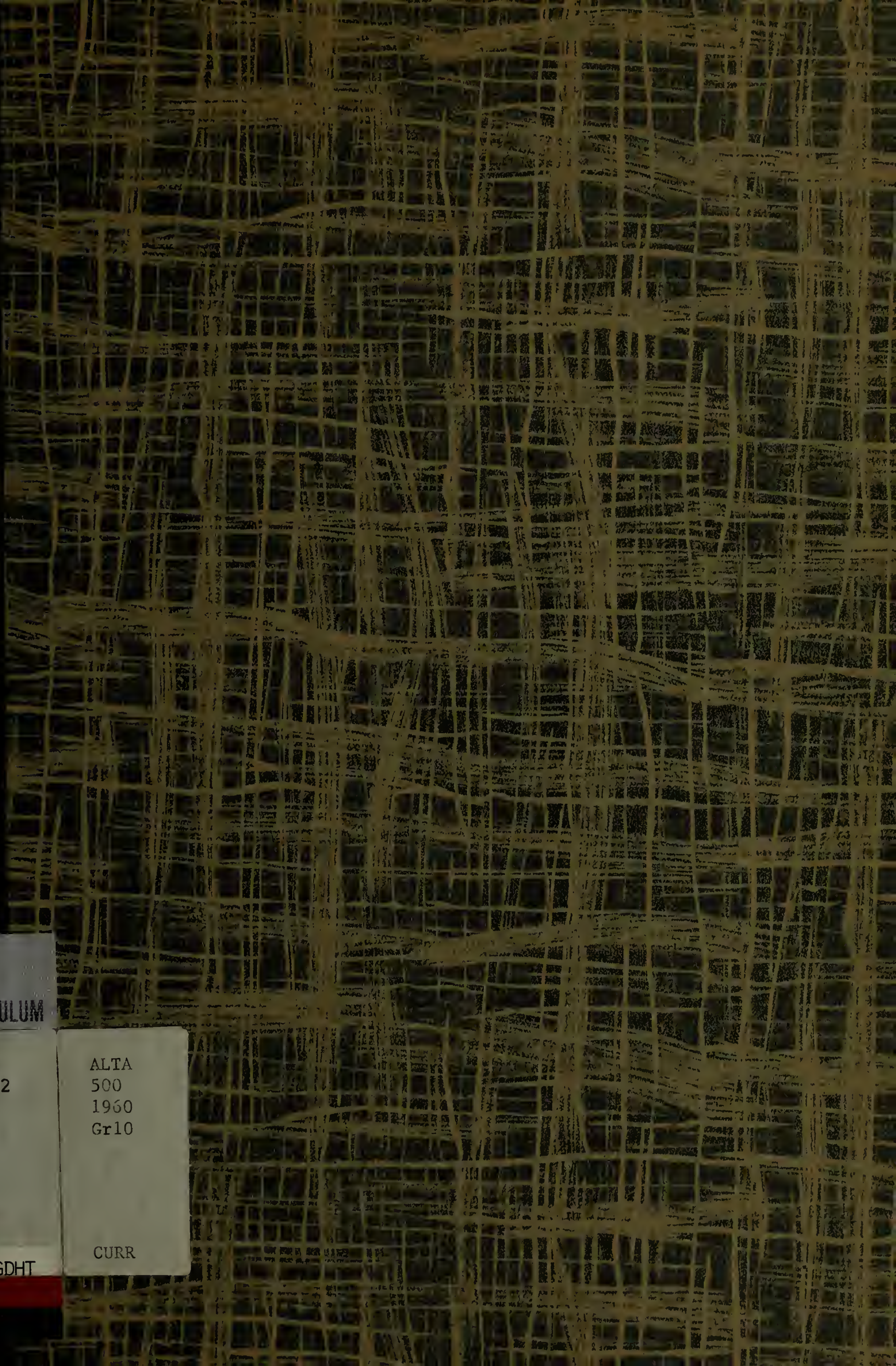

CURRICULUM
Q
181.5
A32422
1960
CURRGDHT

ALTA
500
1960
Gr10
CURR

DEPARTMENT
EDUCATION ALBERTA

EARLY WARNING
ANNOUNCEMENT

REGARDING

SCIENCE 10

FOR

SEPTEMBER 1960

SCIENCE 10

Introductory Remarks:

1. A new course in Science 10 will be introduced in all Alberta schools in September, 1960.

2. A textbook entitled *Introductory Chemistry and Physics,* by Pickard and Radomsky, which covers the contents of the course will be available well in advance of school opening.

3. Science teachers will find that no new science concepts have been introduced, but that there has been a re-arrangement of material, and that certain concepts that were formerly in Grade XI or XII are now to be presented in Grade X.

4. The course outline sets out a logical arrangement of concepts, and should be followed.

5. The new course emphasizes the laboratory method in science teaching and it is expected that students will have opportunities for much more experimental work than previously. The new text lists suitable experiments for the various topics. Correct laboratory techniques should be stressed.

6. The new course places more emphasis upon mathematics than the previous course. Problems are included in the text.

7. The following information for teachers of the new course is included in this brochure:

   (a) An outline of the new course.

   (b) Suggestions re care and maintenance of the laboratory.

   (c) A suggested lesson plan for a lesson in physics.

   (d) A suggested lesson plan for a lesson in chemistry.

   (e) Some observations concerning the science lesson.

   (f) Directions for preparing solutions for use in bench reagent bottles.

   (g) A list of equipment required for experimental work.

   (h) A list of suitable reference material.

Chapter 18. **EXPERIMENTS ON HEAT**

1. To determine the coefficient of Linear expansion.
2. To determine the coefficient of expansion of a liquid.
3. To study the peculiar expansion of water.
4. To determine the expansion of a gas at constant pressure.
5. To determine the specific heat of a metal.
6. To determine the specific heat of a liquid.
7. To determine the heat of fusion of ice.
8. To determine the heat of vaporization of water.

UNIT 7—Sound.

Chapter 19.

Production and Transmission of Sound:
  How sound is produced.
  Transverse and longitudinal vibrations.
  How the ear receives sound.
  Superposition of waves.
  Velocity of sound.
  Reflection of sound.

Intensity Loudness Frequency Pitch:
  How sounds differ.
  Intensity of sound.
  Loudness of sound.
  Pitch of sound.
  The Doppler Effect.
  Audible frequencies.

Resonance and Interference:
  Resonance-sympathetic vibration.
  Resonance in closed tubes.
  Resonance and velocity.
  Interference of sound waves.
  Production of beats.

Sound and Music:
  Difference between music and noise.
  Musical scales.
  Quality of sound.
  The Sonometer.
  Laws of strings.
  Musical instruments.

CARE AND MAINTENANCE OF THE SCIENCE LABORATORY

1. Chemicals and equipment should be stored in a neat and orderly manner. Chemicals can well be arranged alphabetically. All equipment should be cleaned before being put away.
2. All apparatus should be kept in good repair. The teacher should be responsible for minor repairs. For major repairs equipment can usually be returned to the supply house from which it was purchased.
3. Damaged equipment (chipped glassware) should be discarded.
4. A yearly inventory should be taken each spring to determine basic needs. DO THIS NOW. The science teacher is responsible for seeing that chemicals and equipment are ordered and available as required. Purchase of some of the major items of equipment may be spread over a term of several years.
5. A resourceful teacher will find many ways of improvising equipment for experimental work.
6. Care should be taken in storing chemicals e.g. the kerosene level on sodium should be checked: water level on phosphorus, etc. Acids should be stored in a closed cabinet to prevent fumes from reacting with metal equipment.
7. The laboratory should be locked when a teacher is not present for supervision.
8. Students should be taught how to use and care for laboratory equipment.
9. A fire extinguisher should be provided in each science laboratory and should be easily accessible. Students should be instructed in the proper use of the extinguisher.
10. A first aid kit should be available.

A SUGGESTED LESSON PLAN (PHYSICS)

Purpose:

To teach Boyle's Law.

Introduction:

Recall: Find out, by questioning, what pupils know about a gas (air) under pressure e.g. tires, the piston in an air pump, etc. Establish that increased pressure decreased the volume of gas.

Presentation:

Use a Boyle's Law tube or other suitable apparatus to illustrate the concept that as air pressure increases, volume of gas decreases.

Careful measurement will show that if pressure is doubled (2 atmospheres) the volume becomes one half of original volume.

Terms such as "volume", "one atmosphere of pressure" will require review and explanation. From this example Boyle's Law may be developed.

The class might discuss methods of verifying the law. Point out the special condition that the temperature must remain constant.

Use of the term "varies inversely" may be omitted if desired, or may be explained.

Problems:

Some simple problems may be used to ensure that pupils understand the concept.

A SUGGESTED LESSON PLAN (CHEMISTRY)

NOTE: In a lesson in chemistry the plan should always follow a logical order. One step should lead to another and the pupil should be taken from something with which he is familiar to the new material or ideas.

For Example:

In the teaching of the material concerning oxygen the subject might be introduced with a review of what he already knows about the gas.

This might include that it forms a part of our atmosphere and that it is essential to life.

From this the question might be raised of who discovered it as an actual gas. Material from the text should be introduced giving the history of its discovery and the method used to produce it.

This can be demonstrated using HgO and testing the gas with the glowing splint. The work of Lavoisier could be introduced at this point and how oxygen is related to combustion and to life itself.

Laboratory methods, cheaper than the use of HgO, can be introduced here and the properties of the gas discussed and demonstrated.

From the properties, the uses of the gas can be developed.

Commercial production can be discussed stressing reasons for the methods used. In the following lessons the students should produce the gas by one or two methods and demonstrate the properties.

This should give a complete unit study to the subject.

GENERAL OBSERVATIONS CONCERNING THE SCIENCE LESSON

1. All lessons should stress and be illustrations of the scientific method. Conclusions should be based on actual observations wherever possible.
2. Principles illustrated by demonstrations and student experimental work should be emphasized so that the mechanics of the demonstration do not become the important factor.
3. Pictures and diagrams should be used freely. The teacher can easily build a personal file of illustrations taken from the text as well as the advertisements appearing in many periodicals, literature obtained from companies, etc. See the reference list.
4. Constant review on back work in the form of short (5- to 10-minute) tests is valuable. Longer tests used at suitable points in the course should act as a guide to the teacher suggesting the introduction of new work or review of points not mastered by the class.
5. Safety should be stressed at all times. The majority of accidents in school labs are direct results of students not understanding or not following simple directions. Make sure your students understand the reasons for doing things in a definite manner (such as adding the acid to the water when making a solution of sulphuric acid).
6. The vocabulary of science should be emphasized at all times.

BASIC PHYSICAL SCIENCE 10

SECTION 1.

INTRODUCTION TO PHYSICAL SCIENCE

UNIT 1—Short History of Science.

Chapter 1. OUR DEBT TO THE PAST

Science is knowledge.

Early Period—Greeks, Egyptians, Romans, the Dark Ages.

Middle Period—Paracelsus, Bacon, Boyle, Lavoisier. The scientific method.

Later Period—Man applied his knowledge. Progress of today is result of the past.

Value of science to man today.

UNIT 2—Matter.

Chapter 2. MATTER—ITS CLASSIFICATION

Matter—definition, states of matter.

Classes of matter. Pure substances—elements and compounds. Mixed substances — solutions, mixtures, alloys.

Properties of matter—physical and chemical, physical and chemical changes.

Law of Conservation of Matter.

Exothermic and Endothermic reactions.

Energy—various types.

Measurement—a tool of the scientist.

Chapter 3. MATTER—ITS COMPOSITION

Elements—defined by Boyle, Curie —usually exists in solid state.

Distribution of the elements.

Compounds—$Fe+S=FeS$, definition, etc.

Law of definite proportions.

The Atom—Dalton's theory.

Atoms represented by symbols.

Molecules of elements and compounds.

Chapter 4. MATTER—ITS STRUCTURE

Matter—definition.

Matter—as in the Crookes tube.

The discovery of the electron and its nature.

The discovery of the proton and its nature.

Bohr's idea of the atom.

The periodic Table—Mendeleeff.

Moseley—introduces atomic numbers.

Arrangement of structures of various atoms.

Guide to construction of atom diagrams.

SECTION 2.

INTRODUCTION TO CHEMISTRY

UNIT 3—Language of Chemistry.

Chapter 5. SYMBOLS and FORMULAE, THE SHORTHAND OF CHEMISTRY

Representation of compounds by symbols of atoms.

Theory of Ionization—(in short).

Elements gain and lose electrons. Electrovalence.

Elements share electrons. Covalence.

Valence of elements—from transfer and sharing.

Valence, once understood, may be represented by bonds.

Metals and non-metals.

Multiple valence.

Structural formula.

Radicals.

Chapter 6. EQUATIONS—SHORT STORIES OF REACTIONS

The equation is a record of a reaction.

Because equations are records, reactions should be demonstrated.

Writing of equations—start with words, follow with formulae, then balance.
$2\ KC10_3=2\ KC1+3\ O_2$.

Plan for balancing of equations.

Types of reactions: Simple decomposition, simple synthesis, simple replacement, double decomposition.

Another use of the equation: Quantitative.

Percentage composition.

UNIT 4—Four Important Substances.

Chapter 7. OXYGEN—OUR MOST ABUNDANT ELEMENT

History of the gas.

Occurrence.

Preparation—in the laboratory—in industry.

Properties: chemical and physical.

Uses: arising out of the properties.

Chapter 8. HYDROCHLORIC ACID— A TYPICAL ACID

Meaning of term "Acid".
Properties of acids.
Strong and weak acids.
Why hydrochloric acid is typical.
General preparation of an acid.
Acidic anhydrides.
Commercial preparation of HCl.
Properties of HCl.
Definition of an acid.
Uses of hydrochloric acid.

Chapter 9. SODIUM HYDROXIDE— A TYPICAL BASE

Preparation of NaOH in the laboratory.
Properties of NaOH.
Definition of a base.
NaOH is a typical hydroxide.

Neutralization—action of an acid and a base to produce salt and water.
The preparation of sodium hydroxide in industry.
Uses of sodium hydroxide.

Chapter 10. SODIUM CHLORIDE— A TYPICAL SALT

Examples of salts.
Definition of salts.
Occurrence of common salt.
The refining process.
The body requires salt.
Sodium chloride in industry.
Six methods of preparing salts.

SECTION 3.
INTRODUCTION TO PHYSICS

UNIT 5—Mechanics of Fluids.

Chapter 11. FLUIDS

Molecular forces in liquids: Structure of liquids: Cohesion and Adhesion: Surface tension: Capillarity: Viscosity: Osmotic pressure.

Pressures in liquids at rest: Force and Pressure: Pressure independent of direction and shape of vessel, equal in all directions: Water systems and dams: Pascal's Principle.

Pressure in Gases: Layers of atmosphere: Density of air: Pressure of atmosphere: The Barometers: The Manometer: The Bourdon Gage: The Siphon: The Lift Pump.

Fluids in Motion: Bernouilli's Principle: Venturi tube. The Atomizer: The carburetor: Curving of baseball: Velocity of a liquid jet.

UNIT 6—Heat.

Chapter 12. HEAT AND TEMPERATURE

(A brief review of the work covered in Grade IX)

Nature of Heat: Effects of Heat: Heat and Temperature: Thermometers: Determining the fixed points on a thermometer: Marking Degrees on a thermometer: Conversion from one Temperature Scale to the other.

Chapter 13. EXPANSION OF SOLIDS

General discussion of expansion: Coefficient of linear expansion: Coefficient of area and volume expansion.

Chapter 14. EXPANSION OF LIQUIDS

Most of the liquids expand when heated: Apparent expansion: Real or absolute expansion: Peculiar expansion of water: Its maximum density.

Chapter 15. EXPANSION OF GASES

Coefficient of expansion of gases: Determining the coefficient of expansion of a gas: Kelvin or Absolute Temperatures: Charles' Law: General Gas Law: Standard temperature and pressure: Relation between pressure and temperature.

Chapter 16. SPECIFIC HEAT AND THERMAL CAPACITY

Units of Heat: Heat capacity: Specific Heat: Water equivalent: Prevost's Law of heat exchange: Specific heat of solids: Specific heat of liquids.

Chapter 17. LATENT HEAT

Change of state — fusion, melting point, solidification, crystalline and non-crystalline substances, vaporization, boiling point: Latent Heat of Fusion: Measuring Heat of Fusion: Latent Heat of Vaporization: Measuring Heat of Vaporization.

EQUIPMENT REQUIRED BY THE TEACHER FOR ANY SIZE GROUP

Balances, Chemical:

There should be at least one chemical balance capable of weighing to 0.01 grams. In addition, a rough balance for making dilute and bench solutions is a handv piece of equipment. See Physics List.

Balances suitable for school laboratories can be purchased from $50.00 to $200.00 and are obtainable from scientific instrument supply houses.

Glass Tubing:

A supply of glass tubing which can be issued to students for glass work should be kept in stock. A popular size and type is the soft glass tube with the 6 mm. outside diameter. It costs about $1.00 per lb., 15 to 20 lbs. should be kept in stock for a class of 20 students. It can be used for delivery tubes for gas production, making of wash bottles, and exercises in glass work. Do not buy the Pyrex tube as it requires too much heat to soften it to the stage where it can be worked.

Rubber Tubing:

A supply of rubber tubing is necessary for connecting gas burners, delivery tubes, etc. The usual rubber tubing for connecting gas burners has an inside bore of ¼ of an inch. It costs about 25c per foot. Delivery tubes made of 6 mm. glass may be connected by using rubber tubing with a 3/16-inch bore (inside diameter) costing about 20c per foot.

Rubber Stoppers:

A quantity of rubber stoppers, solid, one-hole and two-hole, are needed. They sell in various sizes at about $5.00 per pound. The most useful sizes are No. 2, 3 and 4. In some cases it is well to have a few No. 5 stoppers as well.

Beakers:

The Kipp generator for gases is practically a “must” for any school laboratory producing or using hydrogen gas. Once the generator has been in operation for a few minutes it is a safe source for pure hydrogen gas providing it has been properly set up and instructions have been followed in charging it. However, great care should be exercised in any work with hydrogen gas. The 500-ml. capacity costs in the neighbourhood of $50.00. (Teacher demonstration, only, recommended.)

Graduated Cylinders:

One or two graduated cylinders of 1 liter capacity are necessary in the making of stock solutions. A one-liter cylinder costs about $7.50.

Filter paper, several packages, about 9 cm. diameter are needed costing about 35c per package.

Litmus paper, red and blue, obtainable in books of 100 test strips each are needed. About 20 books of each, running to approximately $6.00 give a suitable stock.

A supply of distilled water should be available. It is necessary for making solutions of silver nitrate especially if tap water contains chlorine or any of the chlorides. It should be used for all stock solutions. It costs about $1.00 for 5 gallons plus deposit on the container. Obtain locally. Cloths, soap, towels, matches, splints, etc., are always necessary.

Crookes Tube and Induction Coil, Pith Balls, Rods, Fur and Silk Cloth:

This equipment is desirable to demonstrate the lessons on the electron. It is usually found in the physics laboratory and should be borrowed for the lessons indicated in the text.

SUITABLE REFERENCE MATERIAL—SCIENCE 10 and SCIENCE 20 (Prices subject to change)

Periodicals:

The Science Teacher—Journal of the National Science Teachers Association. Published monthly by the Association at 1201 Sixteenth Street, N.W., Washington 6, D.C. Membership of $6.00 includes publications and services.

Science News Letter—A weekly summary of current science, published every Saturday by Science News, Inc., 1719 N. Street, N.W., Washington 6, D.C.

School Science and Mathematics—A practical journal for all teachers of mathematics and science. It brings you the latest science articles, new methods for presenting old teaching problems, the new ideas of educational leaders, interesting questions for inquisitive minds, news of the latest books, descriptions of all new apparatus. Central Association of Science and Mathematics Teachers, Inc., P.O. Box 408, Oak Park, Ill.

Endeavour—A British quarterly scientific journal whose purpose is to provide scientists with news of the progress of science. No charge is made for *Endeavour*. Imperial Chemical Industries Limited, Millbank, London S.W.1.

Science News—A publisher's leaflet which gives articles and news of interest to science teachers. Free for the asking, write A & B Science News, Allyn and Bacon, Inc., 150 Tremont Street, Boston 11, Massachusetts.

Periodicals for Teachers and Students:

Science World—Taking over where the textbook leaves off, the *Science World* offers a wide range of appealing materials for the general student as well as the scientifically talented. The Teachers' Edition includes teaching suggestions for each issue, feature articles, references for further student reading and research. Published every two weeks, the *Science World* brings today's exciting world of science and technology into your classroom. $1.50 per year with Teachers' Edition free with ten copies or more. Mail orders to *Science World*, 33 West 42nd Street, New York 36, New York.

Tomorrow's Scientists—Is published four times a year for science students. While the pamphlet *Teaching Tomorrow's Scientists* is a teacher's guide or key for use with *Tomorrow's Scientists*. It gives information on where to get things, useful films and books, and other tips on teaching. Published by the National Science Teachers Association, 1201 Sixteenth Street, N.W., Washington 6, D.C.

Science Materials:

Experiment-of-the-Month Club—Once each month you will receive a Club Experiment Kit complete with chemicals, special equipment and instruction booklets. For example, the first month you will get a kit on Properties of Matter. It shows how we know that matter is made up of atoms and molecules. $24.95, covers a full year's membership. Write to Experiment-of-the Month Club, P.O. Box 325, Danbury, Conn.

Things of Science—Once a month members receive a blue package with objects of science to be handled, experimented with, objects that are new, objects that are old, sometimes odd objects hard to find, sometimes familiar objects needed to complete suggested experiments. Along with these

Preparing solutions for use in bench reagent bottles:

Methyl Orange indicator:	Dissolve one gram of methyl orange in 1000 ml. of water.
Phenolphthalein indicator:	Dissolve one gram of phenolphthalein in 700 ml. of methyl alcohol and dilute to 1000 ml. with water.
Ammonium hydroxide 6N	Add 400 ml. of concentrated ammonium hydroxide to 600 ml. of water.
Barium chloride 1N	Dissolve 122 grams of $BaCl_2 \cdot 2H_2O$ in 500 ml. of water and after the salt dissolved add sufficient water to make 1000 ml. of solution.
Hydrochloric acid 6N	Add 500 ml. of concentrated hydrochloric acid to 500 ml. of water.
Nitric acid 6N	Add 380 ml. of concentrated nitric acid to 620 ml. of water.
Silver nitrate 0.1N	A 0.1 normal solution is suitable for the purposes of this course and may be made by adding 17 grams of silver nitrate to sufficient water to make 1000 ml. of solution.
Soduim chloride 1N	58.5 grams of sodium chloride plus enough water to make 1000 ml. of solution.
Sodium hydroxide 2.5N	100 grams of sodium hydroxide to enough water to make 1000 ml. of solution.
Sulphuric acid 6N	Add 200 ml. of concentrated sulphuric acid to enough water to make 1000 cc. of solution.
NOTE 1.	Caution. When mixing acid and water, always add the acid to the water slowly, stirring the solution.
2.	Instructors may wish to dilute the above solutions further to meet the requirements of certain reactions.
3.	See pages 69-70-71 of the Chemistry 30 Laboratory Manual for instructions re preparation of other reagents.

Student Experimental Work

It is suggested that students should work in groups of two. Each group should be equipped with the following apparatus. This apparatus should be stored at the laboratory station at which the group works. (Prices quoted are approximate.)

APPARATUS (for a group of 2)		UNIT PRICE	TOTAL
Beakers	2 150-ml. capacity	$ .40	$ .80
	1 250-ml. capacity	.40	.40
1 mortar and pestle (small size)		.55	.55
1 Florence flask (500 cc)		.70	.70
1 deflagrating spoon		.20	.20
1 doz. test tubes (medium size, Pyrex)		.08	1.00
2 test tube clamps		.15	.30
3 crucibles and covers (size '0')		.70	2.10
2 4" square wire gauze (asbestos)		.15	.30
1 crucible tongs		.50	.50
2 evaporating dishes		.30	.60
1 Bunsen burner		1.60	1.60
1 Erlenmeyer flask (500 ml.)		.40	.40
2 rubber tube clamps		.20	.40
1 graduated cylinder (50 ml.)		1.50	1.50
1 test tube brush		.50	.50
1 set of ring stand and rings		5.00	5.00
1 funnel (small)		.50	.50
2 utility clamps		1.20	2.40
1 wire triangle (clay guards)		.25	.25

3 wide mouth gas bottles	.45	1.35
1 4" triangular file	.30	.30
1 wing top for Bunsen burner	.30	.30
1 spatula (small)	1.00	1.00
1 asbestos mat (12" square)	1.00	1.00
1 thermometer (—20 to 110° C)	2.50	2.50
1 pneumatic trough	1.10	1.10
6 reagent bottles (4 oz. size—named for chemical reagents, glass stoppers)	.50	3.00
		$30.55

For a group of 20 students $305.50.
There will, however, be some discounts due to quantity buying, case lots, etc.

REAGENTS AND MATERIALS REQUIRED (based on a group of 20 students)

	QUANTITY	COST
Alcohol, Methyl (local purchase)	1 gal.	$ 3.50
Aluminum, sheet	1 sq. ft. 1/32" thick	2.00
Ammonium Hydroxide	4 lbs.	2.70
Barium Chloride, xtals CP.	1 lb.	1.45
Barium Chloride, Tech.	1 lb.	1.10
Calcium Carbonate (marble chips)	5 lbs.	3.05
Calcium Chloride, Gran. USP.	5 lbs.	6.00
Copper, sheet (for strips)	1 lb. 1/32" thick	3.55
Copper Sulphate, xtals CP.	1 lb.	2.25
Cupric Chloride, anhydrous	¼ lb.	2.70
Hydrochloric Acid, concentrated SP.G.1.19	6 lbs.	3.45
Iron filings	1 lb.	1.15
Iron nails (obtain locally)		
Lead, sheet	1 sq. ft. 1/16" thick	2.10
Lemon juice (local purchase)		
Litmus	4 ozs.	2.95
Manganese Dioxide CP.	3 lbs.	12.00
Magnesium ribbon	1 oz.	1.90
Mercuric Oxide CP.	¼ lb.	5.55
Methyl Orange	1 oz.	1.35
Nitric Acid USP.	7 lbs.	4.32
Phenolphthalein	4 ozs.	1.90
Potassium Chloride	1 lb.	1.55
Potassium Chlorate CP.	2 lbs.	6.00
Salt (not iodized) Granular USP.		4.50
Sand (local purchase)	5 lbs.	
Silver Nitrate	4 ozs.	4.00
Sodium Hydroxide, pellets USP.	1 lb.	1.05
Sodium, metal	¼ lb.	1.70
Sodium Sulphate, xtals CP.	1 lb.	1.60
Solder, spool (local purchase)		.50
Sugar, cubes (local purchase)		.25
Sulphur (flowers of S.) powdered	1 lb.	1.50
Sulphuric Acid, SP.G.1.83	9 lbs.	4.50
Vinegar (local purchase)		
Zinc (Mossy) (low in As, Fe and Pb)	1 lb.	10.80
		$102.92

CP—Highest degree of purity. USP—Less pure. Tech—Contains some impurities.

objects of science is an explanatory leaflet and museum-style cards with which to identify the objects for exhibit purposes and further study. $6.00 per year. Science Service, 1719 N. Street, N.W. Washington 6, D.C. Kits for the past four months were: Static Electricity, Non-woven Fabrics, Astronomy, and Butterflies.

The Science Materials Center—Adaptable to home and school use each Science Materials Center "Portable Laboratory" is the result of research, testing and perfecting, so that a single unit can provide all the materials, equipment, and instruction needed to master a specific area in the study of basic scientific principles. Send for catalogue and price list from: Science Materials Center, 59 Fourth Avenue, New York 3, New York. The following are a few examples of the materials they have: Ultra-Violet Science Laboratory, Light Polarizer Laboratory, Pre - Electricity Physics Laboratory, Computer Circuits Laboratory, Color Spectroscope Laboratory.

Books:

Successful Devices in Teaching Chemistry—Paul Westmeyer. ($3.00) J. Weston Walch, Box 1075, Portland, Maine.

Experiments in Laboratory Chemistry—Croal, Couke, Louden. ($2.00) Published by Copp Clarke, Toronto.

Science Model Making—R. R. Hopwood ($1.20). Describes dozens of models and how to make them, like electric motor, electric bell, pin-hole camera, etc. Published by Longmans, Green and Company, 20 Cranfield Road, Toronto 16, Ontario.

Science Experiences with Inexpensive Equipment—C. J. Lyne.
Science Experiences with Home Equipment—C. J. Lyne.
Science Experiences with Ten-Cent Store Equipment—C. J. Lyne.
Each book illustrates, describes, and explains 200 science experiences. These three books differ from other books in this respect: they describe 600 experiences students can have in their own home, with equipment that is found in the home, or can be purchased locally. Published by D. Van Nostrand Company Ltd., 25 Hollinger Road, Toronto 16.

Teaching High School Science: A Sourcebook for the Biological Sciences — Moreholt, Brandwein, Joseph.

Teaching High School Science: A Sourcebook for the Physical Sciences — Moreholt, Brandwein, Joseph.

The two books provide teaching techniques, procedures, demonstrations, projects, experiments and suggestions for the science teachers. The procedures described are typical of the kinds of things that teachers do or want to do, as they teach the biological or physical science—in the variety of forms this takes. Published by W. J. Gage Ltd., 1500 Birchmount Road, Box 550, Scarborough, Ontario.

Illustrated Encyclopedia of Modern Science, 1959—A complete reference work for the school library. This huge volume reprints all the scientific entries in the 20-volume Grolier Encyclopedia, plus additional articles, photographs, and color illustrations. ($29.95) Thomas Allen Ltd., 266 King Street West, Toronto 2B, Ontario.

A New Dictionary of Chemistry—Miall and Miall—Brief explanations of terms used in chemistry and chemical engineering. ($14.00) Longmans, Green and Company, 20 Cranfield Road, Toronto 16, Ontario.

Dictionary of Physics—J. Gray—Covers all branches of physics and is useful to physicists and physics students in schools and universities and their teachers, ($15.30) Longmans, Green and Company, 20 Cranfield Road, Toronto 16, Ontario.

The Chemical Elements—Completely up-to-date, fully indexed, invaluable for reference. Contains the story of each element, its properties, sources, the most important varieties (isotopes), characteristic compounds, and its place in the periodic table. (55c) 10 or more at 50c postage prepaid. Science Service, 1719 N. Street, N.W., Washington 6, D.C.

Your Science Fair—Welte, Dimond, Friedl. ($2.75) Burgess Publishing Company, 426 South 6th Street, Minneapolis 15, Minnesota.

Miscellaneous Materials:

Chemistry Recordings—Part I contains the name, spelling, atomic weight, atomic number and valence of forty-two chemical elements. Part II contains the name, spelling and correct pronunication of 86 important terms used in Chemistry. Part III contains the name and identification of 98 technical terms used in atomic science. Order from Audio Educational Aid, Dept. 53, Box 250, Butler, Missouri. The records are 33⅓ R.P.M. (over 40 minutes) $3.65.

The Elemental Slyd-Rul—Tell you at a glance, symbol, weight, density, number, valences, color, melting and boiling point in °C for the 98 elements. ($1.00 postpaid). The Slyd-Rul Co., Canaan, N.Y.

The Essentials of Chemistry—1956, Graham and Cragg, Clark, Irwin Company.

The Elements of Chemistry—1959, Craff, Graham, Young, Clarke, Irwin Company.
(Lab. manual for the above.)

Physics a Basic Science—Burns, Verwiebe, Hazel and Van Hooft Van Nostrand Company Inc.

Teachers should watch for free materials.
e.g. Free publications, trade magazines, etc., (e.g. Imperial Oil Review, C.I.L. Oval, Monsanto Magazine).

Free materials (e.g. Alcan Kit: Sifto Salt Kit, etc.).

See *"Classroom Aids for Teachers"* for a more complete list of free materials.

Q 181-5 A32422 1960
ALBERTA DEPT OF EDUCATION
EARLY WARNING ANNOUNCEMENT
REGARDING SCIENCE 10 FOR
39838095 CURR HIST

000017632175

Q 181.5 A32422 1960
Alberta. Dept. of Education.
Early warning announcement
regarding Science 10 for
39838095 CURR HIST

CURRICULUM GUIDE

For Reference

NOT TO BE TAKEN FROM THIS ROOM

EXCEPT WITH LIBRARIAN'S PERMISSION